

FOREST HEALTH BULLETIN



Figure 1. Oak stem borer



Figure 2. Red oak borer

HARDWOOD TREE BORERS

INTRODUCTION

With so much attention on the emerald ash borer and tree death due to the winter storm and past drought, many people are noticing things about trees that they haven't before. People are paying more attention to the amount of dead and declining trees on road sides, forests and street plantings. Because people are looking more carefully at dead and dying trees, they are going to notice things that, although new to them, have always been there.

BORER FUNCTION

Everything in nature has a function and creates a benefit, at least while it is in its native habitat. Living and dead trees use resources that are needed by other trees. Living trees use water, sunlight and nutrients and compete with other trees for these resources. A borer accelerates the decomposition of a tree so that more resources are available to the remaining trees.

TYPES OF BORERS

Flat-headed borers (Buprestidae), round-headed borers (Cerambycidae) (fig. 1 & 2), bark and ambrosia beetles (Curculionidae: Scolytinae) (fig. 3) and horntails (Siricidae) are just a few groups of borers. Borers can attack any part of a tree. When a borer attacks a tree, it is simply using that tree for reproduction as it is adapted to do.

HOST ATTRACTION

Many insects regardless of feeding habits use specific hosts (plant or animal) whether it is one species or an entire genus. Borers are especially adapted to using specific hosts because they are exposed to the internal environment of a plant for the majority of their lives. The internal host environment (e.g. tree sapwood) can vary according to moisture level, sap flow pressure and volatile chemical composition. This variability can affect if an insect survives within its host.

Borers are attracted to specific hosts in part because the host produces specific chemicals to which the insects happen to be attracted. These chemicals, often called host volatiles (substances that easily turn to gas), can vary in composition between species or genera.



Figure 3. Hickory bark beetle

SIGNS

Being borers, the insects create galleries under bark. The galleries are easily seen in firewood, logs or trees that have been cut or fallen for at least several weeks. The galleries can also be found in standing dead trees or trees that have been noticeably stressed for extended periods. Another noticeable borer sign is the presence of exit holes (fig. 4). These holes are made by insects when they chew their way out of a tree after they have developed into adults. Entry holes are rarely noticed except in some cases of pine beetles or the holes some longhorn beetles excavate for egg laying (fig. 5).



Figure 4. Redheaded ash borer exit hole



Figure 5. Round-headed borer egg laying site.



Figure 6. Hickory agrilus galleries



Figure 7. Hickory agrilus damage

SIGNS CONT.

The galleries of many borers are often very distinct. Characteristic galleries are sometimes used in combination with the identification of the host tree to identify a pest. The hickory agrilus (Buprestidae) has a very distinct zigzag gallery (fig. 6) that is sometimes seen through the bark after callus tissue formation (fig. 7). Bark beetles can also have distinct galleries as with the hickory bark beetle (fig. 8) and smaller European elm bark beetle (fig. 9) which have centipede-patterned galleries.

Other common signs of borer activity are stain fungi associated with bark beetles and siricid wasps. Additionally, pine trees can show resin flow from entry and exit holes.

MANAGEMENT

Because most borers are not the cause of tree death and decline, management is usually not necessary. Those insects most often become significant in stands that are overstocked or suffering heavily from stresses such as severe drought or dramatic competition with invasive plants.

You won't find a tree without some kind of borer association. Usually, any tree will have multiple species of borers associated with it. So, galleries under the bark of a dead or highly stressed tree is often nothing to worry about. In other cases, such as with invasive exotic species, it is best to learn about those pests and the similar non-pest species in the area.

FYI

The cottonwood borer (fig. 10) is one of Kentucky's largest borers. It feeds mostly on cottonwood but also on willow and poplar. It can be up to 1.5 inches long as an adult and larva. The adult length doesn't include the very long antennae. Cottonwood borer larvae feed in the roots near the crown and in the lower bole.

PHOTO CREDITS

Figure 1, 5, 6, 7, 8— James Solomon, USDA Forest Service, Bugwood.org

Figure 2— Robert L. Anderson, USDA Forest Service, Bugwood.org

Figure 3— Natasha Wright, FDACS, Bugwood.org

Figure 4— Daniel Herms, The Ohio State University, Bugwood.org

Figure 9— William M. Ciesla, Forest Health Management International, Bugwood.org

Figure 10— Charles T. Bryson, USDA ARS, Bugwood.org



Figure 8. Hickory bark beetle galleries



Figure 9. Smaller European elm bark beetle galleries



Figure 10. Cottonwood borer